Washington State Department of Transportation

WSDOT SOP 730

Correlation of Nuclear Gauge Densities With Hot Mix Asphalt (HMA) Cores

1. When evaluating HMA compaction:1.1 A gauge correlation is required:
    a. For each combination of gauge and HMA Mix Design (initial JMF).
    b. When gauge mode changes (i.e., direct transmission to thin layer).
    c. When a gauge is recalibrated.

    1.2 A gauge correlation is not required but may be considered by the Region Materials Engineer when:
    a. Base material changes from the original correlation base (i.e., from a surfacing base to an asphalt base).
    b. Lift thickness change (i.e., 2″ to 4″)
    c. The same gauge-HMA Mix Design (Reference Mix Design) combination are used on a different contract within the same construction year
    d. When JMF has been adjusted in accordance with *Standard Specifications* Section 9-03.8(7)A.

2. Gauge correlation is based on 10 in-place HMA densities and 10 cores taken at the same locations. In-Place HMA densities shall be determined in accordance with WSDOT FOP for WAQTC TM 8. Cores should be taken no later than the day following paving and before traffic has been allowed on roadway. Correlation cores are not required to be taken at record density locations therefore, a site outside the traveled way should be considered for worker safety.

    Note 1: If a core becomes damaged, it shall be eliminated from the average.

    Note 2: Cores may be taken sooner than the day after paving if the HMA is cooled to prevent damage during coring and removal of cores. Water, ice, or dry-ice may be used to cool the pavement. Another method of cooling that may be used is substitution of nitrogen gas or CO2 for drilling fluids.

3. Obtain a pavement core from each of the test sites in accordance with WSDOT SOP 734. The core shall be taken in the nuclear gauge footprint. If direct transmission was used, locate the core at least 1 in (25 mm) away from the edge of the drive pin hole.

4. Core densities shall be determined in conformance with AASHTO T 166 Bulk Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry Specimens.

5. Correlation factor shall be determined to 0.001 using Standard Form 350-112: Correlation Nuclear Gauge to Core Density, or the MATS database.